

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents research methodology. It presents about research design, population and sample, research instrument, data collection technique and data analysis. Each of them is discussed separately in the following section.

3.1. Research Design

Research design of this research uses an experimental research. Experimental research is the process of planning the data to get the specified variables. According to Ary (2010:217) stated that experimental research is a scientific research that is conducted to manipulate independent variable, to observe the influence of dependent variable and to control the relevant variable.

In this research, the independent variable is cooperative integrated reading and composition (CIRC) as a technique for teaching reading while the dependent variable of this research is the students' achievement in reading comprehension which is measured by post-test after giving the treatment. Here, the researcher used cooperative integrated reading and composition (CIRC) technique as treatment. It is aimed to increase the student's achievement when they will be taught using CIRC technique in reading comprehension.

The experimental design of this research is quasi experimental research. According to Ary (2010:316) Quasi and true experimental design that have the similarity to manipulate the independent variable whereas the difference in which the subjects are not given at random.

In this research, the researcher is an impossible to conduct true experimental in SMPN 2 Kebomas because true experimental need to randomize the variable. It means that the researcher has to change the classification of the class in which has been fixed by the school. In this school, it prohibited to change the classification of the class. So, the researcher conducted quasi experimental with non randomized subjects, pre-test and post-test quasi experimental design.

The quasi chart can be seen in the table below:

Group	Pre-test	Treatment	Post-test
Experiment	+	+	+
Control	+	-	+

Table 3.1. None randomized subjects, pre-test and post-test quasi experiment.

Where:

+ : with treatment

- : without treatment

The procedures of the research design are as follows:

1. The respondents (subject) are given pre-test to measure the students' competence before giving the treatment.
2. The respondents (subject) are given the treatment in teaching reading comprehension. Cooperative Integrated Reading and Composition (CIRC) technique is conducted as the treatment in this research.
3. The respondents (subject) are given post-test to measure the students' progress after giving the treatment.
4. The researcher calculated the results of the pre-test and post-test scores. Here, the researcher found the mean score of two groups.

5. The researcher analyze the data using t-test formula to prove the hypothesis
6. H_0 is received if t statistic $>$ t table.
7. H_0 is failed if t statistic $<$ t table.

From the table 3.1 above, it can be concluded that the researcher divides two groups including experimental and control group. Pre-test is given to two groups in the beginning of the research. Afterwards, the experimental group is given by CIRC technique for four meetings with the different theme. Meanwhile, the control group is given a lecturing technique for four meetings. Afterwards, post-test is given to both of groups.

3.2. Population and sample

In this research, the researcher chooses SMPN 2 Kebomas because the students have less ability in reading comprehension. It is showed that the students difficultly answer the question and find the meaning of the text. So, the researcher used CIRC technique to increase the students' achievement in reading comprehension. Furthermore, CIRC technique is never applied in this school. That was known by the researcher after the researcher conducted the observation and interviewed some teachers who are taught English in the eighth grades. Therefore, the population of this research is the eighth grade students of SMPN 2 Kebomas in the first semester 2014/2015 academic year.

Afterwards, there are nine classes of the eighth grade. Every class consists of 28 students. Because of the limited time, the researcher used the cluster sampling to get the class which would be represented as the sample. Cluster sampling is a sampling technique that used to that is used when the researcher had

trouble getting the sample to be researched because the total of the sample is too large. Cluster sampling is also the way to get the sample randomly. In this research, the researcher took two classes as the sample based on the students' ability in reading comprehension. Then, the researcher divided the students into two groups include the experimental and the control group. The experimental group was VIII F class while the control group was VIII G class. The researcher took VIII F class and VIII G class because the students had the equal characteristics in the average score of the previous semester. The average score of the previous semester showed in the table appendix.

3.3. Research Instrument

Research instrument is so influential in doing this research. The success of this research instrument greatly depends on the role which was made. Therefore, the researcher acts as the practitioner who had the important roles in doing this research. Here, the researcher used a test to measure the prior knowledge. To make the test valid, the researcher searched another class which had the equal characteristics as the characteristics of VIII F and VIII G students.

Research instrument of this research was narrative English tests. It was used by the researcher because it was suitable with the syllabus of the eight grades. The syllabus of the eight grades is supported by the KTSP curriculum. In this research, the researcher used a test that had the different themes especially fable and fairy tales themes. By using various themes, the students get more information. So, the students comprehend those texts easily.

In this research, the researcher gave narrative test. The test items were 20 items in which used the multiple choices items. Here, the researcher gave two tests that consist of pre-test and post-test. Those tests were explained as follows:

3.4.1. Pre test

The researcher gave pre test to know the previous ability before giving treatments. Pre-test had some procedures to support this research. That procedure describes as follows: before receiving the treatment, the researcher gave the test consist of 20 items. The test was in form of multiple choices items. The questions of the test were related to their material what will be learned. After finishing the test, the students' submitted their work. Then, the researcher evaluated the student's task. Pre-test conducted to two classes as the sample separately. Afterwards, the researcher divided into two groups including the experimental and control group.

3.4.2. Post test

The researcher gave post test to measure the students' progress after giving the treatment to the experimental group whereas the control group was taught traditionally without giving the treatment. Afterwards, the procedure of post test had the same procedure of pre test.

3.4. Data Collection Technique

An important part of this research collects the data. Here, the researcher collects the data to avoid some mistakes in getting the data. In collecting the data, the researcher takes the students' scores from the tests. Here, the researcher collects pre-test and post test scores. In this research, the researcher analyzed pre-

test and post-test scores by using SPSS version 16.0 program. It purposed to measure the tests which will be examined. In pre-test and post-test, the researcher measured the item tests to be valid and reliable. The validity and the reliability can be explained as follows:

3.4.1. The validity of the test

According to Ary (2010: 225) stated that the validity is the most consideration in developing and evaluating measuring the instruments. It means that validity is an instrument of the research in evaluating the test. In this research, the validity of the test focuses on the result of the reading comprehension test that consists of pre-test and post-test. The researcher analyzes two tests to be valid. The researcher also checked the content validity and the construct validity. To determine the content validity, the researcher asked to the English teacher checking the instrument validity as syllabus, lesson plan and scores criteria. The score of multiple choices, there are 20 items and every correct answer could 1 point, totally 20 point. Whereas to determine the construct validity, the researcher used the assistance of SPSS version 16.0 programs to compute descriptive statistics. The instrument validity was examined by analyzing item was good or not. The researcher used in testing the validity in:

$$r_{-xy} = \frac{N(\sum xy) - (\sum x)(\sum y)}{\sqrt{\{N\sum x^2 - (\sum x)^2\}(\sum y^2 - (\sum y)^2)}}$$

Where

R_{xy} : the coefficient of correlation X and Y variable or validity of each item.

- N : the number of students/subject participating in the test
- X : the sum of X scores
- Y : the sum of X scores
- $\sum Y$: the sum of total score for each student.
- $\sum X$: the sum of total score in each item.
- $\sum XY$: the sum of multiple score from each student with the total score in each item
- $\sum X^2$: the sum of the square score in each item and,
- $\sum Y$: the sum of the total score from each student.

Each item square is determined by using these following categorizations:

- <0, 3 is difficult
- 03 - 07 is medium
- 0, 7 - 1 is easy

To analyze the result of the validity of the test, the researcher saw the corrected item-total correlation table. In the corrected item total correlation table, the value was under 0.3. So that, this items which was under 0.3 could be rejected. Then, the value was above 0.3. So this item could be accepted.

From the result of the validity of the test, the researcher analyzes pre-test and post-test scores. In pre-test score, the researcher found that 15 items were valid and 5 items were invalid. It means that 15 items could be accepted relates to the students' competences. In post-test score, the researcher found that 18 items were valid and 2 items were invalid. It means that 18 items could be accepted relates to the students' competences.

3.4.2. The reliability of the test

The researcher uses the reliability in which it is an important element to measure the quality of the test. To measure the reliability, the researcher should to know the consistency of the test scores. In addition, the researcher would be tried out the test in VIII A class of SMPN 2 Kebomas because that class had the equal characteristics as the characteristics of VIII F and VIII G students.

In this research, the researcher gave try out to VIII A class that consists of 30 questions with three themes. There are fable, fairy tales, and the legend themes. But the researcher has been found the items which were accepted by the students. There are fable and fairy tales themes. Moreover, the researcher used fable and fairy tales themes in this research. After conducting try out, the researcher gave pre-test and post-test that consists of 20 questions. Here, the researcher used SPSS version 16.0 program to determine the reliability of the test with formula:

$$r_{kk} = \frac{K.Sx^2 - \tilde{x}(k - \tilde{x})}{Sx^2(k - 1)}$$

$$s = \frac{\sqrt{\sum F_x}}{n - 1}$$

$$\chi = X - \tilde{x}$$

Where:

K : total item that accepted

N : total students followed the test

χ : total of correct answer a student

F : total of student who got the particular score in x

Criterion:

$0.0 \leq r_{kk} < 0.20$ is the lowest reliability

$0.20 \leq r_{kk} < 0.40$ is the low reliability

$0.40 \leq r_{kk} < 0.60$ is the quite reliability

$0.60 \leq r_{kk} < 0.80$ is the high reliability

$0.80 \leq r_{kk} < 1.00$ is the highest reliability

In this research, the researcher analyzed pre-test and post-test scores in the *cronbach's alpha table*. In pre-test, the cronbach's alpha value was 0.78. That value was above 0.60. It means that the pre-test item was the high reliability. In post-test, the cronbach's alpha value was 0.82. That value was above 0.60. It means that the post-test item was the highest reliability.

3.5. Data analysis

After the data is collected, the researcher analyzes the data. In analyzing the data, the researcher uses the independent sample t-test in SPSS version 16.0 programs. Independent sample t test is used to compare the score of the experimental and control group. The researcher used SPSS version 16.0 programs to compare a significant difference whether there is positive effect of using cooperative integrated reading and composition (CIRC) technique for teaching reading comprehension of narrative text.

Assumptions for the independent t-test are:

- (1) Independence: the observation of each sample must be independent (the samples do not influence to each other)
- (2) Normal Distribution: the scores of the population must distribute normally

- (3) Homogeneity of variance: the two populations must be equal variances (the degree of the distributions is approximately equal).

3.6.1. Normality Distribution Test

According to Santoso (2006:157) found that the normality distribution test is used to test whether the distribution test is normal or not. It means that we need to test the distribution test to be normal. The distribution test is said normal if the significant value or the probability value is larger than the level of significant (0.05). While, if the significant value or the probability value is lower than the level of significant (0.05) so that the distribution test is not normal.

To test normality distribution test, the researcher used kolmogrov smirnov in SPSS version 16.0 program with the following procedures. The first procedure was inputting the pre-test score in the data view. The second procedures were going to analyze, nonparametric, and 1 – sample K-S. The third procedure was interpreting the normality distribution test. In this research, the researcher need to see the monte carlo (sig. 2 tailed).

3.6.2. Homogeneity Test of Variance

According to Santoso (2006:158) found that homogeneity test of variance is used to test whether two sample that have been taken have the same variance or not. It means that we need to test two sample that have been taken have the same variance or not. Two sample is said the same variance if the significant value or the probability value is larger than the level of significant (0.05). While, if the significant value or the probability is

lower than the level of significant (0.05) so that, those samples are not the same variance.

In this research, the researcher used independent sample t test in SPSS version 16.0 program to test the homogeneity test of variance with the following procedures. The first procedure was inserting the pre-test score of two groups in the data view. The second procedures were going to analyze, compare means, and independent sample t test. The third procedure was interpreting the homogeneity test of variance. Here, the researcher need to see the levennes' test to know whether two sample of experimental and control group are homogeneous or not. .

The test of Levenes' test defines with the formula:

$$P = \frac{(N - k) \sum_{i=1}^k N_i (Z_i - Z_{...})^2}{(k - 1) \sum_{i=1}^k \sum_{j=1}^{N_i} (Z_{ij} - Z_i)^2}$$

Where:

P : the result of the test,

K : the number of different groups to which the samples belong,

N : the total number of samples,

N_i : the number of samples in the i^{th} group,

Y_{ij} is the value of the j^{th} sample from the i^{th} group,

$$Z_{ij} = \begin{cases} |Y_{ij} - \bar{Y}_i|, \bar{Y}_i \text{ is a mean of } i^{\text{th}} \text{ group} \\ |Y_{ij} - \tilde{Y}_i|, \tilde{Y}_i \text{ is median of } i^{\text{th}} \text{ group} \end{cases}$$

The significance of P is tested against $F(\alpha, k - 1, N - k)$ where F is a quintile of the F test distribution, with $k - 1$ and $N - k$ its degrees of freedom, and α is the chosen level of significance (0.05).

3.6.3. Hypothesis Testing

Independent t-test was used to find out the significant effect between experimental and control groups. Here were steps of t-test calculation:

- a. The first step was stating the hypothesis and setting the alpha level at 0.05 (two tailed test).
- b. The second step was finding t-value using independent sample t-test formula and comparing the probability with the level of significance for testing the hypothesis.
- c. The last was write the results of the tests were subjected to the following statistical procedures.

In this research, the hypothesis was a null hypothesis that said, “There is a significant effect between the use of CIRC technique and without the use of CIRC technique to increase the students’ achievement in reading comprehension

The hypothesis can be formulated as follow:

H_0 = (null hypothesis) is $\mu_1 - \mu_2 = 0$ ($\mu_1 = \mu_2$)

H_1 = (Alternatives hypothesis) $\mu_1 - \mu_2 \neq 0$ ($\mu_1 \neq \mu_2$)

H_1 : Reading comprehension using cooperative integrated reading and composition (CIRC) technique.

H_0 : Reading comprehension without using cooperative integrated reading and composition (CIRC) technique.

Hypothesis testing in this research was:

H0 : There is no significant difference on the effect of cooperative integrated reading and composition (CIRC) technique in reading comprehension between experimental and control group.

H1 : There is significant difference on the effect of cooperative integrated reading and composition (CIRC) technique in reading comprehension between experimental and control group.

The second step was finding t-value using independent sample t test formula and comparing the probability value with the level of significance for testing the hypothesis. Determining t-critical in table t- (0.05) df, the researcher compared t-observed and t- critical. If $t_{obs} < t_{critical}$, the researcher should accept the null hypothesis and if $t_{obs} > t_{critical}$, it means the researcher can reject the null hypothesis and another word. The researcher can accept the alternatives hypothesis.

T-test was calculated to find out the comparison of two means between experimental and control group pre-test and post-test. In analyzing the data, the researcher used independent sample t-test formula.

The formula used in calculating t-test is:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{s_{\bar{x}_1 - \bar{x}_2}}$$

Where: $s_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{S^2_{pooled}}{n_1} + \frac{S^2_{pooled}}{n_2}}$

Pooled variance: the average of the two sample variances, allowing the larger sample to weight more heavily.

Formula:

$$s_{pooled}^2 = \frac{(df_1)s_1^2 + (df_2)s_2^2}{df_1 + df_2} \quad \text{OR} \quad s_{pooled}^2 = \frac{SS_1 + SS_2}{df_1 + df_2}$$

$df_1 = df$ for 1st sample; $n_1 - 1$

$df_2 = df$ for 2nd sample; $n_2 - 1$

Estimated Standard Error of the Difference

$$s_{\bar{x}_1 - \bar{x}_2} = \sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

Clearly, the results of the tests were subjected to the following statistical procedures. To calculate t-test, the researcher used SPSS (Statistical product and service solutions) version 16.00. The post test of experimental and control groups were analyzed with the following procedures. The first procedure was inserting the post test data of both experimental and control groups using the data view. The second procedure was going to the analyze Menu, selecting compare means, and then choosing independent sample t-test. The last procedure was interpreting t-test output; automatically it could answer to the research questions about the comparison between two groups.

In short, the primary data was collected by means of pre-test and post-test to find out the significance on the effect of cooperative integrated reading and composition (CIRC) technique in Reading comprehension.